

## ABSTRACT

Provided is a quantum cryptography communication apparatus capable of preventing a photon pulse from being phase modulated and also capable of freely selecting any repetitive frequency of a light source. In the quantum cryptography communication apparatus, a quantum receiver apparatus includes: a light source; an optical path loop having a multiplexing/interfering means for generating time difference twin photon pulses from the photon pulses of the light source and for multiplexing and causing interference between a signal optical pulse corresponding to a retrograde quantum and a reference optical pulse; a bypass optical path having a phase modulator for phase modulating only the received reference optical pulse; and a photon detector for observing the interfered light passed through the optical path loop, and a quantum transmitter apparatus includes: a polarized wave rotating means for rotating polarization planes of the twin photon pulses at a right angle in a non-reciprocal manner; a phase modulator for phase modulating and returning the signal optical pulse passed through the polarized wave rotating means, to the quantum receiver apparatus; and a beam attenuating means.